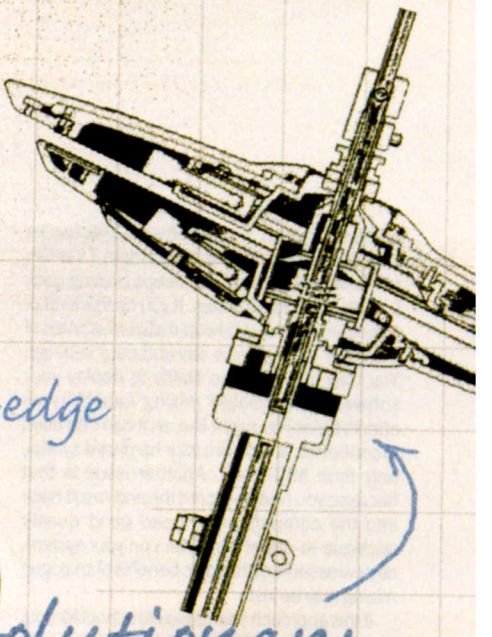
V-DRUMS SPECIAL

Top Secret

Brief: V-Drum Prototype

electronic percussion cutting-edge

revolutionary



high-tech

innovative

the making of...
ROLAND V-DRUMS

V-Drums have revolutionised plugged-in percussion. *PowerOn* looks back on the milestones that have made the V-Drums so popular in studios and on stages around the world today.

Words: Steve Fisher, Hiroyuki Nishi and Greg Rule

The first thing that comes to mind when Roland is mentioned is probably synthesizers and digital recorders, as the company has produced some of the world's most cutting-edge examples of these musical tools over the years. But now another instrument category has become synonymous with Roland: electronic percussion.

Since 1997, Roland has steadily increased its profile in the electronic drumming community and can even now lay claim to being the premiere high-tech drum company in the world. Roland's V-Drums are ubiquitous, as the V-Drums line continues to break sales records and win awards worldwide. From legendary masters of nuance such as Neil Peart, Vinnie Colaiuta and Omar Hakin to smash-hit pounders such as Rocky Gray from Evanescence, V-Drums are in high demand in studios and on stages around the world.

How did Roland rise to such heights in electronic drumming? Let's take a magical history tour of the Roland V-Drums family tree and find out how a group of innovative engineers and musicians revolutionised the world of plugged-in percussion.

Here's an account of three V-Drums milestones, as told by Roland's Product Specialists Hiroyuki Nishi and Steve Fisher. >>>

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>>> 1997: Birth of the V-Drums

Nishi: After Roland released the VG-8 (V-Guitar) in 1995, we had many requests to use our COSM technology for drums. "Develop the V-Drums in addition to the V-Guitar!" everyone was saying. This COSM technology was mainly related to the sound module (TD-10) development, but we think the biggest turning point for V-Drums was the completion of the mesh head, which replaced the previous rubber pad, the PD-7.

In the PD-7, we used a floating structure to pull the rubber down to the edge of the pad, floating on the pad frame, which didn't satisfy us.

Fisher: Plus we felt the gum rubber pads provided a synth-like action and we wanted to help drummers get an acoustic feel. The challenge was to get the acoustic feel without the acoustic noise. We knew that if we could provide drummers with the electronic counterpart to their acoustic drums – like keyboard players and guitar players have had for years – we'd be successful.

Nishi: To get a natural feel, we agreed that we should use something like film or skin as head material for the pad.

Our Mechanical Designer, Mr Yoshino, visited a supermarket for carpentry and gardening goods and coincidentally he came across a small trampoline, which used a mesh-type material for the bouncing mat. He then had an inspiration: Roland could use a mesh surface for the drum pad.

The V-Drums went through a lengthy development process

A trampoline provided inspiration

We couldn't find any good subcontractors to produce the mesh head in Japan so Mr Kakehashi, the founder of Roland, introduced us to Remo Beli, the founder of Remo. We asked him to produce the mesh head for us and he agreed.

Fisher: We did extensive testing with different types of mesh, weave patterns, densities and combinations. We discovered that a certain kind of mesh – in two layers with the weave patterns at 45-degree angles – was the best and we were able to patent it.

While developing the mesh head, we became aware of Remo's Acousticon material used in their drum and percussion shells. That's when we switched from the original steel shell idea to the Acousticon shell. The Acousticon material not only gave us the desired 'acoustic' drum look, it also provided us with the ability to make any shell size, depth and thickness. Plus it's extremely strong, and we weren't wasting any natural wood resources.

Although the mesh head was quiet, playing rim shots wasn't. Playing the prototype upside down, we discovered that the rubber pour on the bottom of the shell felt great and was quiet too. We asked Remo if they could also put a rubber pour on the top counterhoop. They made custom moulds and sure enough, it worked really well. It kept the whole performance of the drum really quiet, which was a key benefit of electronic drums.

Nishi: At this point, we had completed two missions: to use the COSM technology for the sound module, and to improve the look and feel of the pad.

2001: V-Cymbals

Before we arrived at the current materials and structure of the V-Cymbals, we engaged in the following tests:

Acoustic cymbals (metal base) with rubber surface

To reduce the noise of acoustic sound, we attached the rubber on the bottom side of the acoustic cymbals, but when we hit the top cymbal – the metal surface – it was too noisy. Also, when we tested rubber attached to both sides of the cymbals, it reduced the noise but was too heavy for use. Actually, when we hit the pad too hard, it dented. Of course, this was not suitable.

Mesh base

With our knowledge of mesh materials from the V-Pad developed earlier, we tested the mesh base for V-Cymbals, but we couldn't design it in the shape of a real cymbal even though we stretched the mesh tight. It didn't have a good feel when played, so we had to give up the mesh idea.

Plastic base with rubber surface

Since the metal and mesh base prototypes couldn't satisfy us in producing the ideal V-Cymbals, we went for a plastic base in the third revision. The plastic-based cymbal itself wasn't so good in terms of feel and its sensitivity

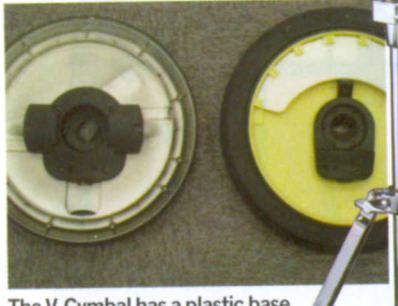
Ready to take a pounding: the V-Pad

The V-Cymbals went through various trials

was limited when struck too far from the pickup point, so we improved the position and structure for the sensor.

Since we had to connect the V-Cymbals to the sound module via cable, we considered how to stop the cymbal from revolving while allowing it to swing freely like a natural cymbal. We solved this by producing a V-Cymbal that could be mounted on a regular acoustic cymbal arm or stand without over-rotating.

Fisher: Another issue we had was the vibration, which was making it difficult to trigger accurately, so we altered the shape of the internal cymbal plate, which limited the vibration waves and improved sensitivity and accuracy. We received a patent for this as well.



The V-Cymbal has a plastic base

2005: V-Hi-Hat

Nishi: The newest generation of V-Drums kits (starting with the TD-20S) featured a new star component: the V-Hi-Hat.

Technically, there were two primary factors in the development of the V-Hi-Hat.

1) To accurately send the impact signal to the sound module.

2) To send the information of the open/closed condition between the top and bottom pads to the sound module.

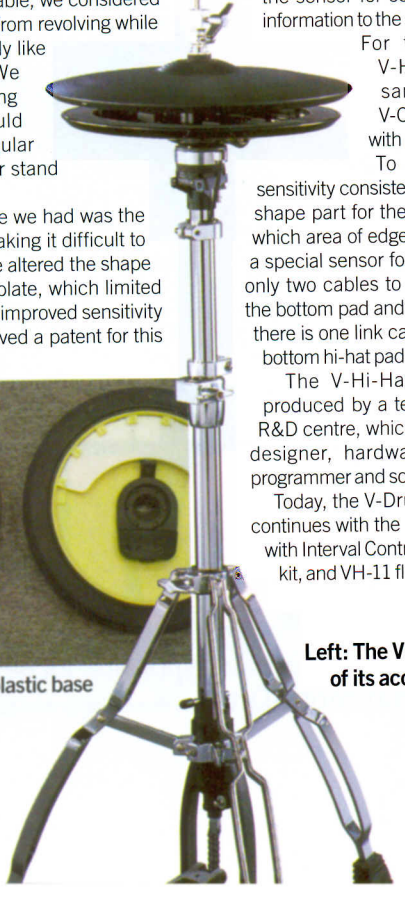
To meet these goals, we set up the motion sensor in the centre of the bottom pad and tried many mechanical structures, such as optical-type sensors or Hall elements. Finally, we decided to use a spring to push down the sensor for sending the open/closed information to the sound module.

For the materials of the V-Hi-Hat, we used the same materials as the V-Cymbals: an internal base with rubber surface.

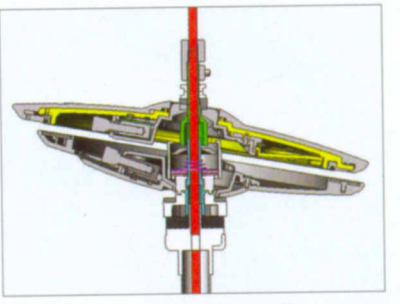
To improve the hi-hat's sensitivity consistency, we used a crescent-shape part for the top pad. To distinguish which area of edge/bow was high, we used a special sensor for detection. We required only two cables to be connected between the bottom pad and the sound module, while there is one link cable between the top and bottom hi-hat pads.

The V-Hi-Hat was developed and produced by a team of six people at our R&D centre, which included a mechanical designer, hardware designer, software programmer and sound engineer.

Today, the V-Drums legacy of innovation continues with the new TD-12 drum module with Interval Control, the TD-12S V-Drums kit, and VH-11 floating Hi-Hat.



Left: The VH12 models the feel of its acoustic counterpart



The V-Hi-Hat structure in detail

All in a day's work... the PCG team

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